

KUHNEN & WACKER
Patent- und Rechtsanwaltsbüro



Europäisches Patentamt

Erhardtstrasse 27

80331 München

September 9, 2005 KS/KC/KC
[File: 100479526]

Official File No. : PCT/IB2005/000470
Our Reference : 85/TY00N14/WO
Owner/Applicant: Toyota Jidosha Kabushiki Kaisha

In response to the International Search Report and the Written Opinion of the International Searching Authority dated June 26, 2005 and as enclosure to the Demand for the International Preliminary Examination according to Art. 33 PCT, the following **Statement on the Written Opinion of the International Search Authority pursuant to Art. 34 PCT** is herewith submitted:

The Examiner's thorough analysis of the case is appreciated. However, it cannot be agreed to the Examiner's assessment that the subject-matter of independent claims 1 and 9 of the present invention lacks novelty.

Further, it can also not be agreed to the assessment that the subject-matter claimed is not based on an inventive step.

1. Referring to the subject-matter of claim 1:

- 1.1. As the Examiner correctly noted, **JP 08-192639 (D1)** discloses a mounting structure for a fuel cell device installed in a front portion of a vehicle, whereby the vehicle has a

RAINER A. KUHNEN
PA EP ETD Dipl.-Ing.

PAUL-A. WACKER
PA EP ETD Dipl.-Ing. Dipl.-W.-Ing.

DR. JÖRG DORNER
PA EP ETD Dr.-Ing. Dipl.-Ing.

DR. HERIBERT MÜNSTERER
PA EP ETD Dr. rer. nat. Dipl.-Chem.

STEPHAN KOPP
PA EP ETD EPL Dipl.-Ing.

RAINER K. KUHNEN
PA ETD Dipl.-Ing.

DR. ANDREW MAY
PA EP ETD Dr. rer. nat. Dipl.-Chem.

CORNELIUS BOBBERT
PA ETD Arzt(MD) Dipl.-Ing.

ALEXANDRA BESCHORNER
RA

DR. BETTINA GLASER
RA Dr.jur.

Of Counsel:
JAMES A. FORSTNER
Attorney at Law PhD (chem), JD
Admitted Delaware, D.C., USPTO

POST/MAIL:
POSTFACH/P.O.BOX 1964
85319 FREISING/GERMANY

BESUCHER/VISITORS:
PRINZ-LUDWIG-STRASSE 40A
D-85354 FREISING/GERMANY

TELEFON +49-8161-608-0
FAX (G3) +49-8161-608-100
FAX (G4) +49-8161-608-104

VIDEO
CONFERENCE +49-8161-232-139
(prior appointment required /
nach telefonischer Vereinbarung)

E-MAIL info@patentfirm.de
INTERNET www.kuhnen-wacker.de
www.kuhnen-wacker.com

PA Patentanwalt/Patent Attorney
EP European Patent Attorney
ETD European Trademark and Design Attorney
EPL European Patent Litigation Diploma (CEIPI)
RA Rechtsanwalt/Attorney at Law

BANKVERBINDUNGEN
BANK ACCOUNTS

HYPO-VEREINSBANK FREISING
BLZ 700 211 80 Konto 4 032 500
Swift: HYVEDEMM418
Iban: DE14700211800004032500

COMMERZBANK FREISING
BLZ 700 400 41 Konto 5 120 555
Swift: COBADEFFXXX
Iban: DE72700400410512055500

SPARKASSE FREISING
BLZ 700 510 03 Konto 26 500
Swift: BYLADEM1FSI
Iban: DE18700510030000026500

DEUTSCHE BANK MÜNCHEN
BLZ 700 700 24 Konto 9 343 500
Swift: DEUTDE33HAN
Iban: DE58700700240934350000

VAT-Nr.: DE 813 496 485



frame that extends in a longitudinal direction of the vehicle.

The frame known from **D1** has a deformable, even formed front frame portion (14a) that deforms due to a load acting on the frame in the longitudinal direction of the vehicle thus absorbing collision energy. Further, a cutout section (16) is provided on an intermediate lower side of the frame for allowing an upward flexure of the frame.

Still further, the mounting structure comprises a fixing member that fixes a fuel cell to the frame so that the fuel cell moves relative to the deformable portion, when the deformable portion deforms.

In detail, a fuel cell housing (30) that comprises a notch section (32) with a rectangular upper side and both lateral sides open in a wedge form in the center of the housing is fixed on the front portion (14a) of the frame. A groove (34) connecting the end of the section (32) is formed on the bottom center of the housing (30), wherein the groove (32) and the cutout section (16) are kept aligned with each other.

In case the deformable portion of the frame moves upward due to a collision, the fuel cell will, as a result of the wedge shaped part of the casing, break into two parts thus preventing the collision energy absorption member (the deformable portion of the frame) from being hindered to absorb the collision energy. However, the fuel cell or any other device suffers from the load acting thereon and will be damaged at least while being separated into to parts.

Therefore, although it appears consequential to provide deformable portions to reduce collision caused load acting on the frame of a vehicle resulting in an decreased amount of impact transmitted to a vehicles compartment, provision of such portions does, however, not prevent the transfer of load acting on the frame to the storage battery device or other auxiliary equipment provided in the engine compartment.

Therefore, even if the deformable portion reduces the load acting on the frame and the vehicle's compartment, the storage battery device will still be damaged resulting in an increased risk of secondary accidents in cases of fuel cell batteries. This problem may be much more serious in case the storage battery



device is provided in a rear portion of the vehicle.

Nevertheless, it is the objective problem of the invention to provide a mounting structure for a battery storage device which will prevent or at least reduce the damage to the storage battery device.

To solve this problem the invention provides a mounting structure having a deformable portion wherein the deformable portion is bended upward in order to improve reduction of load acting on the storage battery.

Especially, as it can be gathered, for example, from figures 4A and 4B, the present invention provides a mounting structure, wherein the storage battery device is moved upward due to the upward flexure of the defromable portion.

Therefore, when a collision occurs, the deformable portion of the frame bends upwards and tilts the entire storage battery upwards thus preventing the storage battery being damaged without separating the storage battery device although if the storage battery device is provided in a rear portion of the vehicle.

However, document **D1** does not provide any teaching how to prevent a storage battery device from being damaged due to load acting thereon.

Especially, it can not be gathered from **D1** that the deformable portion is formed by bending the frame upward thus resulting in an "n"-shaped portion.

However, by means of such shaped frame it is not only possible to reduce the load acting on the frame and the vehicles compartment, but also to prevent or at least reduce the damage to the storage battery device.

Therefore, the subject-matter of claim 1 is novel and inventive over closest prior art known from document **D1**.

- 1.2. Further, the **US Patent 5,476,151 (D2)** discloses a structure for arranging auxiliary components of an electric vehicle. The objective problem to be solved with the teaching of document **D2**, however, is to reduce the amount of an impact load which is transmitted from an object located in front of the vehicle to a vehicle compartment by means of the auxiliary components.



Therefore, different possibilities are disclosed to move the auxiliary components out of the deformation way thus not transmitting load from the front of the vehicle to the compartment.

However, the storage battery device or any other auxiliary component will be damaged due to compression of the space available for the respective components thus also resulting in an increased risk of secondary accidents in cases of fuel cell batteries.

In contrast thereto, the present invention provides a mounting structure having a deformable portion, wherein the deformable portion is bended upward in order to improve reduction of load acting on the storage battery, and wherein as it can especially be gathered from figures 4A and 4B, the storage battery device is moved upward without compression of available space due to the upward flexure of the defromable portion.

Therefore, when a collision occurs, the deformable portion of the frame bends upwards and simply tilts the entire storage battery upwards thus preventing the storage battery being damaged although if the storage battery device is provided in a rear portion of the vehicle.

Therefore, the subject-matter of claim 1 is also novel and inventive over the prior art known from document D2.

2. Referring to the subject-matter of claim 9

2.1. Further, document **D1** also discloses a housing for a fuel cell that is basically rectangular shaped.

However, the teaching of **D1** does not show any feature of claim 9.

Especially, the housing known from **D1** does not disclose that the mounting structure comprises a fixing member that fixes a rearward portion of the storage battery device, wherein the fixing member includes an inclined portion that is inclined forwardly upward.



Moreover, what is indicated as the fixing member with an inclined portion with reference numeral 70 in document **D1** rather corresponds to the housing for the storage battery device of the present invention than to the fixing member having the inclined portion.

As it can be gathered from Fig. 6 from document **D1**, the fuel cell may possibly ride upward on a structural frame member 114b that is disposed behind the fuel cell and in front of the vehicles compartment.

However, since the fuel cell is moved upward, a collision with the engine hood may occur resulting in further damages of the fuel cell.

In contrast thereto, the fixing member of the present invention having the inclined portion is shown in detail in Fig. 5, wherein reference numeral 510 indicated the inclined portion.

This special fixing member with the inclined portion allows a bumper of a rear-ending vehicle to ride over the inclined portion or climb the respective portion, so that the rear-ending vehicle is restrained from contacting the rearward portion of the battery. Therefore, it is possible to prevent the damage to the battery pack.

2.2. As regards document **D2**, it has to be ascertained that this documents does not at all provide any hint concerning a inclined portion or a movement of a rearward end of any auxiliary part of an electric vehicle in an upward direction along a fixing member or any other part.

2.3. Therefore, neither document **D1** nor document **D2** disclose these features of the subject-matter of claim 9 of the present invention. Therefore, the subject-matter of claim 9 is novel and inventive over the prior art known from **D1** and **D2**.

3. Summarizing, it has to be ascertained that the cited prior art neither discloses nor suggests the features of independent claims 1 and 9.

Therefore, the present invention is not only novel but also based on an inventive step.



In view of the afore discussed facts and in view of having fulfilled all formal requirements according to PCT, it is now respectfully requested to establish a positive International Preliminary Examination Report (IPER).

In case there should still remain basic objections to patentability of the subject-matter claimed, a

Hearing

according to **Art. 34(2)(a) PCT** and **Rule 66.6 PCT** is herewith respectfully requested. In order to agree upon a mutually convenient date, the Examiner is asked to contact the undersigning attorney.

If only minor amendments are considered to be necessary, it is requested to also get in touch by phone with the attorney who undersigned this petition, so that amended papers immediately can be filed in order to expedite the procedure.

Patent Attorney

Rainer A. Kuhn

(ID-Code 325887, ☎ +49-8161 608 302)